

Assignment no. 02 B DS

Problem Statement

Organizing Cards in a Hand:

Application: When playing card games, players often use an approach similar to insertion sort to organize their cards. They pick one card at a time and insert it into the correct position in their hand, maintaining a sorted sequence. Write a program that demonstrates how to organize (sort) cards in a hand using insertion sort

Code

```
#include <iostream>
using namespace std;

int main() {
    // Step 1: Start

    const int size = 5; // You can change this value if needed
    int hand[size];

    // Step 2: Input n cards (e.g., numbers like 2, 5, 10)
    cout << "Enter " << size << " cards (as integers): ";
    for (int i = 0; i < size; i++) {
        cin >> hand[i];
    }

    // Step 3: For each card i from 1 to n-1:
    for (int i = 1; i < size; i++) {

        // Step 4: Take the current card as key
        int key = hand[i];

        // Step 5: Compare it to cards before it in hand
        int j = i - 1;

        // Step 6: Shift larger cards one position to the right
        while (j >= 0 && hand[j] > key) {
            hand[j + 1] = hand[j];
```

```

        j--;
    }

    // Step 7: Insert key in the correct position
    hand[j + 1] = key;

    // Step 8: Display the hand after each insertion
    cout << "After inserting card " << key << ": ";
    for (int k = 0; k < size; k++) {
        cout << hand[k] << " ";
    }
    cout << endl;
}

// Final sorted hand
cout << "\nSorted hand: ";
for (int i = 0; i < size; i++) {
    cout << hand[i] << " ";
}
cout << endl;

// Step 9: End
return 0;
}

```

OUTPUT

```

PS C:\Users\DELL\Desktop\practice\.vscode> cd "c:\Users\DELL\De
02B } ; if ($?) { .\ds02B }
Enter 5 cards (as integers): 4 6 2 1 7
After inserting card 6: 4 6 2 1 7
After inserting card 2: 2 4 6 1 7
After inserting card 1: 1 2 4 6 7
After inserting card 7: 1 2 4 6 7

Sorted hand: 1 2 4 6 7
PS C:\Users\DELL\Desktop\practice\.vscode> 

```